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ABSTRACT

Germany's Dual System, which consists of in-school and in-enterprise components, facilitates entry into 374 recognized technical, white-collar and blue-collar occupations listed in training regulations that are grounded in legislation. The Dual System's origins and development in Germany were examined along with several attempts to replicate the German model in other countries. The literature on transfer and replication of the Dual System model was reviewed, and micro case studies of attempts to adopt the German model in the following countries were presented: Botswana; Costa Rica; the Dominican Republic; India; Indonesia; Lebanon; Seychelles; Singapore; and Sri Lanka. Reflections of Germany's Dual System in United States work-based youth apprenticeships were also considered. Of all the countries examined in the micro case studies, only Singapore seems to have replicated the German record of participation of 64%-81% of 16- to 18-year-olds in the Dual System. It was concluded that integration of academic and technical-vocational curricula is extremely difficult in nations where technical and vocational education and training is often perceived to be second-class education. It was further concluded that Germany's culture of in-firm training may be the most difficult-to-develop attribute of the Dual System in developed and developing nations alike. (Contains 52 references.) (MN)

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The German 'Dual System' of Occupational Training:

A Much-Replicated but Oft-Failed Transfer

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The German 'Dual System' of Occupational Training:
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David N. Wilson, Ph.D.

Introduction

The German 'Dual System' of occupational training has long been touted as a *panacea* to 'cure' the ills of vocational training systems in both developed and developing nations. This writer addressed the issue in an earlier study and re-examines the phenomenon in the light of experience in several other nations. (Wilson, 1997, p. 437) The Dual System was described as a "combination of practical and theoretical vocational training at two places of learning with different legal and structural characteristics: in-plant and in-school training." (*Ibid.*) The feature which sets the Dual System apart from nearly every other national training system is the fact that nearly 75 percent of "all 16-to-19 year-olds" pursue this path "in their transition from school to work." (Deissinger, 1997, p. 299)

Ashwill noted that the Dual System "is world renowned" for its 'dual' combination "of part-time general education and on-the-job vocational training for ... graduates of the *Hauptschulen* and *Realschulen*" streams of lower-secondary education. (Ashwill, 1995, p. 1) During the past few years, an increasing number of students from the élite *Gymnasium* stream have also entered the Dual System. The Dual System "also makes employers responsible for the training and socialization of young people," in partnership with these educational institutions. (Deissinger, 1997, p. 299)

Of all the nations which claim to have adopted – and adapted – the Dual System, it appears that only one nation – Singapore – has even come close to replicating the system and integrating it into its national training infrastructure. This paper examines the transfer and replication of the German 'model' in, *inter alia,* Botswana, Costa Rica, Dominican Republic, Indonesia, Lebanon, Seychelles, Singapore, Sri Lanka, and Thailand. In addition, aspects and attributes of the 'model' have been recommended for adoption – and adaptation – in many more developing and developed nations, including the U.S.A. and U.K.

The first sections of the paper will describe the origins of the Dual System and how it currently functions in Germany, address the changes currently taking place in response to both technological change and globalisation, and then examine several systems which have purported to adopt the Dual System. The similarities and differences between the German 'model' and its several replications will then

be examined. The final section of the paper will examine factors that have contributed to both successful and failed transfers of the 'model.'

Origins of the "Dual System"

The workplace origins of the dual vocational training system have been traced to the medieval Guilds, which "developed training systems and determined who, how, and what needed to be taught ... in the 12th and 13th centuries." (Schmidt, 1998, p. 28) "The school-based component of the dual system emerged in the 16th and 17th centuries, when religious and artisanal Sunday Schools were established." (*Ibid.*) "These schools ...evolved into general and commercial schools of continuing education and, at the beginning of the 20th century, were structured according to occupations." (*Ibid.*) The current German structure of education dates from 1948, according to Foraker. (1995, p. 1) Wilson noted that "education has been the exclusive responsibility of *Land*, or state, governments since 1947, when the allied powers de-centralised the former Nazi unitary educational system." (1997, p. 438) Thus, the Dual System is "grounded in over 500 years of craft and trade apprenticeship [and] has instilled a 'training culture' in the mind-set of all Germans." (Wilson, 1992, p. 33)

The Current German Educational System

The current German educational system comprises "a pyramid of academic achievement," (Ashwill, 1995, p. 1) beginning with the *Grundschule*, or primary school of four years duration. At about age ten, "the German school system tracks students of differing abilities and interests into different school forms." Selection was traditionally accomplished by examination and was quite arbitrary, however, this has changed in recent years. Currently, their "*Grundschule* teachers recommend ... students to a particular school based on criteria such as academic achievement, potential and personality characteristics, such as ability to work independently and self-confidence," but "in most states parents have the final say as to which school their child will track to following the fourth grade." (NISACA, 1999, p. 1)

At the lower-secondary stage, students then enter either the *Gymnasium*, "the most selective secondary school," for a rigorous academic programme, or the *Hauptschule*, "which leads to part-time enrollment in upper-secondary vocational schools combined with apprenticeship until the age of 18," or the *Realschule*, "which leads to higher vocational schools." (Ashwill, , p. 1) The National Institute on

Student Achievement, Curriculum and Assessment Case Study on Germany noted that "in spite of the far-reaching changes of the past 30 years, including the shift from elite to mass education, Germany's traditional three-tiered system of education at the secondary level remains intact." (NISACA, p. 1)

The *Gymnasium* "offers a rigorous academic curriculum for university-bound students" leading to award of the *Abitur,* "which qualifies students for university entrance," (*Ibid.*) or to enter the Dual System, after thirteen years of education. Approximately 25 percent of the age cohort enrol in *Gymnasiums*. (NCES, 1996, p. 1) The NISACA Case Study noted that "although it is possible for students to switch to a higher-level school form with improved performance, it is not a frequent occurrence." (NIASCA, 1999, p. 1) However, the Case Study also notes that students "may transfer to the *Gymnasium* after completion of the *Realschule* (11th grade)" and "in some states it is also common for students to transfer to the *Gymnasium* following the sixth grade." (NISACA, p. 2)

The *Hauptschule*, which was introduced in 1964, has been described as "the least demanding track" and "is attended by students headed for lower-skilled jobs and vocational training immediately after secondary school." In the 1992-93 school year, "25 percent of 14-year olds attended *Hauptschulen*." (NISACA, p. 2) The *Hauptschule* has also been characterised as having degenerated into "remainder schools," or a 'dumping ground' for children of *Gastarbeiters* (guest-workers) in urban areas. (Lehmann, 1995, p. 17) The NISACA Case Study observed that "in some schools visited, non-native German speakers comprised over 60 percent of the student body," but they also noted that "in high grades ...in the *Hauptschule*, teachers described immigrant students as harder working and more dedicated than their German counterparts." (NISACA, 1999, p. 8)

The *Realschule* has been described as "a compromise between the two, offering a largely academic curriculum, but without the same depth, breadth, or rigor as the *Gymnasium*:" (Duren, 1996, p. 2) This track is "differentiated between the *Unterstufe* (lower level) , which incorporates the 5th, 6th and 7th grades, and the *Oberstufe* (upper level), which includes the 8th, 9th, and 10th grades." Enrolment comprised "24 percent of 14-year-olds ... and an additional 7 percent enrolled in combined *Haupt/Realschulen* (the latter located mostly in the eastern states." These combined institutions are also known as *Mittelschulen*. (NISACA, p. 2) *Realschule* graduates sit the parallel *Fachhochschulreife* examination after twelve years of education, which

qualifies them for admission to *Fachhochschulen*, or post-secondary polytechnics, but not to universities.

From the 1960s, in *Länder* "governed by the Social Democratic Party," *Gesamtschulen*, or comprehensive secondary schools, were established with "the idea of more egalitarian access to education" and are compared to "public schools in the United States." In 1992-93, "9 percent of Germany's 14-year-olds attended integrated *Gesamtschule*." "Students who satisfactorily complete the *Gesamtschule* through the 9th grade receive the *Hauptschule* certificate, while those who satisfactorily complete schooling through the 10th grade receive the *Realschule* certificate." (NISACA, p. 2)

The In-School Component of The Dual System

Between 60 and 70 percent of students who have completed these three lower-secondary school tracks enter the various forms of tertiary education. The 'traditional' path to university entrance has been to continue at a *Gymnasium* for upper-secondary education, but an increasing number of *abituren* enter the Dual System in order to obtain both academic and vocational qualifications. (NISACA, 1995, p. 1) The in-school component of the Dual System is the responsibility of the 16 *Länder* and is delivered in part-time upper-secondary *Berufsschulen*.

The 'traditional' Dual System path, after completion of either *Hauptschule* or *Realschule*, has been for upper-secondary study at a part-time *Berufsschule*, or vocational school. "Depending on entry-level skills and knowledge, these programs last between two and three and one-half years." While employed part-time in companies under the *Lehrstelle*, or labour contract, "apprentices are required to attend [*Berufsschule*] for one or two days per week, or in blocks of time lasting several weeks." (Schmidt, 1998, p. 29) On-the-job practical training in enterprises is complemented in *Berufsschulen* , where 60 percent of the instruction is theoretical and 40 percent comprises general education. (Campbell, 1993, p. 52) The "core courses" in this general education component include "mathematics, the sciences, German language and literature, history, and foreign languages." (Durden, 1996 , p. 3) Although *Berufsschulen* are considered in Germany to be a component of upper-secondary education, they are comparable to community, or junior, colleges in North America and elsewhere. (Diepold, 1989, p. 1)

Increasing numbers of graduates from *Gymnasia* have also entered the Dual System because "vocational education is also viewed by some students as a springboard to further study, possibly at a university." (NISACA, 1995, p. 6) While formerly "90 percent of all *Berufsschule* students had a *Realschule* diploma, now, there are more students with *Abituren* that enroll in the *Berufsschule*." This trend has created "the problem of having to teach students of differing abilities and degrees of motivation" because "the better students tend to be *Abitur* holders, while the weaker students are usually the *Hauptschule* graduates." (NISACA, 1999, p. 7) The NISACA Case Study notes that "each year around 600,000 young people, two-thirds of those who have completed their compulsory education, enter training programs in the dual system." (*Ibid.*) However, with increasing numbers of *Gymnasium* leavers entering the Dual System, "the chances of applicants with a low-level secondary school leaving certificate (*Hauptschulabschluss*) entering the dual system are limited." (Ulrich, 1997, p. 309) Buck compares enrolment patterns of the 1960s, when 'nearly two-thirds of all pupils attended the *Hauptschule*," with those of the 1990s, when "only one third went to this type of secondary schooling." (Buck, 1997, p. 6)

At the conclusion of the two or three-year Dual System, students sit "a final examination to earn a certificate of completion for [their] particular job title." The examination committees comprise representatives of employers, labour unions, and *Berufsschule* instructors, "who administer the exam according to BIBB performance standards." The apprentices "have three chances to pass the exam, and at the third try, nearly all (92%) are successful." In addition to the trade certificate, "students receive a *Berufsschule* certificate." (Durden, 1996, p. 3)

In recent years, a second, full-time, upper-secondary school path has involved study at a *Berufsfachschule*. (Wilson, 1992, p. 35) The *Berufsfachschule* differs from the *Berufsschule* component of the Dual System by not including a part-time work component. After completion of full-time *Berufsfachschule* study, practical experience is acquired "in common workshops operated by the *Arbeitsamt*, or Federal Employment Service." (Wilson, 1997, p. 445) These studies lead to the *Fachabitur*, which facilitates entrance to polytechnics. (NICASA, 1999, p. 3)

<u>The In-Enterprise Component of The Dual System</u>

The 16–year-old *Berufsschule* entrants "sign an apprenticeship contract (known

as a *Lehrstelle*) with a local firm to work part-time, for below entry-level wages, in return for training at the firm." (*The Jobs Letter*, 1996, p.2) These training contracts "must be registered with the respective chamber." (Deissinger, 1997, p. 299)

It was reported that many German "employers encourage academic achievement by awarding the more sought-after apprenticeship positions to students who have performed better in school." (Stern, Bailey and Merritt, 1996, p. 15) This differentiation by ability was also noted by Ulrich, who wrote that "school leavers with intermediate secondary education (*Realschule-Gesamtschulabschluss*) are mostly trained in industrial, trade and service occupations" while "commercial operations in banks, insurance companies and larger industrial enterprises often require school leavers to have the *Abitur*" which he noted to be equivalent to "A-level ... allowing access to higher education." (Ulrich, 1997, p. 310)

While employed in enterprises, apprentices are trained by a *Meister*, who is trained and licensed by the *Land*, or state, government. CEDEFOP reported that the ratio of *Meister* to apprentice was 1:2.4. (CEDEFOP, 1989) Simultaneously, the "theoretical aspects of training are provided in publicly run and financed vocational secondary schools." (Gill and Dar, 1996, p. 1)

Legislative Authority for The Dual System

"In the absence of a centralized national ministry of education, according to Ashwill, "national standards are established by the Conference of Ministers of Education (*Ständige Konferenz der Kultursminister*, or KMK), which performs a national coordinating function." The KMK was founded in 1948 to oversee "the cultural policy of all states" and is a "forum in which the individual states coordinate the structures, institutions, curricula, and leaving certificates of their school and higher education systems." (1995, p. 2) The KMK comprises the Federal Ministry of Education and Science (*Bundesministerium für Bildung und Wissenschaft*) (BMBW) and the *Land* Ministries of Education and Culture (*Ministerien für Kultur und Bildung*).

The *Berufsbindungsgesetz*, or BBiG, the Vocational Training Law, "was promulgated at the *Bund* (federal) level in 1959." (Wilson, 1997, p. 438) "A formal agreement between the federal government and the *Länder* (state) ministries of education lays out the procedures for co-ordinating education and training." (Gill and Dar, 1996, p. 1) The BBiG is administered by the *Bundesinstitut für Berufsbildung*, or BIBB, The Federal Institute for Vocational Training, which is composed of

representatives from the Chambers of Industry and Commerce, labour unions, the *Bund* (federal) and *Länder* (state) governments and training institutions. (Wilson, 1991, p. 11) In addition, the 1972 and 1984 Regulations on the Competence of Trainers (*Ausbilder Eignungsverordnung*), enacted for each of the 374 occupations recognised under sections 20-24 of the BBiG, establish a bi-level hierarchy for the certification of trainers, either at the basic level of Instructor or at the advanced level of *Meister*, or Master. (Wilson, 1992, p. 34)

The Dual System facilitates entry to 374 recognised training occupations, listed in training regulations that are grounded in legislation, "ranging from highly technical fields such as electronics, to white-collar fields such as sales and administration, to traditionally blue-collar occupations such as mechanic, machinist, and craftsman." (NCES, 1996, p. 1) Over 40 such recognised training occupations are in the business and administrative sector, (DFG, 1999, p. 1) while others are in "crafts, technology, health, agriculture or home economics." (Diepold, 1989, p. 1) The number of recognised training occupations declined from about 600 to 374 between 1970 and 1996. (Deissinger, 1997, p. 300)

"Regulatory control of vocational training is decentralized among 480 regional chambers," (Gill and Dar, 1996, p. 2) which are quasi-public bodies, such as the 69 "Chambers of Commerce and Industry, which control the in-plant component," (Wilson, 1997, p. 438) and 56 Chambers of Crafts and Trades, the Chambers of Agriculture, Home Management (Economics), Maritime, Public (Civil Service), Notaries, and the Chambers of the Professions (Bar Associations and Medical Councils). (Campbell, 1993, pp. 56, 60 and 61) "The chambers ensure equal standards of vocational qualifications throughout" Germany. These chambers conform to the "principle of self-government" embodied in the Vocational Training Act "as a central organizational feature." (Deissinger, 1997, p. 299) "The first qualification standards only date back to the 1920s." (*Ibid.*, p. 300)

Participation in The Dual System

In 1997, about "1.6 million young people – with a female proportion of around 40 per cent – learn their trades through the dual system." In 1995, "578,600 young people took up an apprenticeship." "Since 1985, participation [in the Dual System] of the average age cohort of the 16-18 year-olds has varied between 64 and 81 per cent." (Ulrich, 1997, p. 309) Of these entrants, "45.2 per cent contracted with an industrial or commercial firm, while 38.9 per cent took up a

traditional craft apprenticeship." "The most popular ... occupation with a percentage proportion of around eight per cent of all male apprentices" is automobile mechanic. (Deissinger, 1997, p. 299) "Two-thirds of [these apprentices] are trained in companies with fewer than 50 employees." In addition, "most ... are trained in a small number of very popular occupations", including for example, "motor vehicle mechanics, electrical fitters, machine fitters, masons, joiners, gas and water fitters, bank clerks and industrial clerks among males; and physicians' assistants, office clerks, saleswomen, hairdressers, dentists' assistants, and bank clerks among female trainees." (Ulrich, p. 309)

In 1993, "German employers spent DM22.8 billion on in-company training whereas vocational education in schools (including part-time vocational schools) required a mere DM 8 billion of public expenditure." (Deissinger, 1997, p. 299) Schlicht observed in 1994 that "the German economy finances the practical training of skilled workers in an amount three times greater than that which the state makes available for training at vocational schools." (1994, p. 7)

Modernisation of the Dual System

It is widely recognised that "the German system ... is continuing to evolve as educators and employers ... try to adapt to changing economic conditions and skill requirements." (Stern, Bailey and Merritt, 1996, p. 23) These responses to the challenges posed by the *globalisation* of production and technological change are motivating both employers and *Bund* and *Land* institutions to modernise the Dual System. Campbell indicated that "as technology, manufacturing processes, and the organization for work change, so do the training regulations." (Campbell, 1993, p. 58) He also observed that BIBB has prepared "158 new training regulations for a total of 194 skilled occupations." (*Ibid.*, p. 59) Buck wrote that "there is emerging concern that [the Dual System] of learning and qualification may not fulfill modern education and training needs." He questioned the "relevance of the Dual System to the 1990s economy" and noted that "there is growing concern about the understanding of work that is embedded in the Dual System." His rationale was:

> Since the 1980s, changes in work organization, enforced by the imperatives of new technologies, market changes, and environmental problems, have demanded new capabilities among workers. Work is no longer determined by a sequential production process, and work organization is no longer dictated by mechanical technology. Therefore, the work concept mainly embodied in the dual System has to change from the concept of 'production' toward a concept of 'entrepreneurship.' (1997, pp. 3-4)

The NCRVE noted that "the German system is still evolving as German educators and employers adapt to changing economic and skill requirements." One measure is that "the theoretical and intellectual content of apprenticeship training has been continuously upgraded, and is now considered comparable to that of a two-year associates degree in the United States." In addition, German training institutions "are working towards strengthening the teaching of the interdisciplinary and social skills required in more stable professions that maintain their cultures and identities despite changes in technology." This was stated to result in "a more thorough integration of academic and vocational education within the apprenticeship system." It was also noted that "in recent years the two traditional pathways are merging" since "a growing number of *Abitur* holders are completing apprenticeships *before* entering the university." Because "some employers ... have recently been turning to universities and polytechnics to supply highly-skilled entry-level employees," the dual system has taken measures to "avoid the resulting threat" by facilitating "admission of dual system graduates to higher education." (NCRVE, 1997, pp. 2 and 3) Stihl, President of the Central Association of German Crafts told a summit on the future of the dual system that "new and updated occupations were needed to penetrate new sectors," citing in particular "the IT occupations, which arrange qualifications in information and telecommunications." (CEDEFOP, 1998, p. 1)

During the 1990s there was a crisis in the Dual System precipitated by the economic downturn that resulted from the challenges of globalisation and modernisation. In some industries, places for apprentices decreased by 50 percent. This can be partly explained by the 22 percent increase in labour costs between 1990 and 1995. ((Bradley, 1996, p. 10) A cost-consciousness also existed in firms claiming that training costs are too high. Moreover, *Abiturienten* who proceed to higher education, following completion of their apprenticeships, are considered to have been lost to industry and, therefore, employers allege that it is too expensive to train new apprentices. This criticism appears to be somewhat short-sighted, since many may return to these enterprises as graduate engineers, or economists, etc. Those who proceed to higher education are also accused of taking training places from those who are more in need of training. Kraemer indicates that "although no firms are required to offer vocational training, [but] most participate because they consider it economically beneficial in the long run." (1995, p. 7)

Berufsakademien were first established in 1974 in Baden-Würtemburg and are considered to be a component of tertiary education. Although some other *Länder* have established *Berufsakademien*, the majority preferred to expand their *Fachhochschulen*. The three-year *Berufsakademien* combine institution-based education with employment in an enterprise. In effect, these institutions constitute an upward-differentiation of the Dual System to the post-secondary level. Students obtain the *Abitur* at the conclusion of their secondary school programme and also must obtain a work contract with an employer as a condition of admission to the *Berufsakademie*.

Ulrich indicated that "many companies prefer [*Berufsakademien*] to graduates from universities, emphasizing the benefits of real work experiences." (1997, p. 314) An evaluation by the Science Council (*Wissenschaftsrat*) placed *Berufsakademien* on an equal footing with *Fachhochschulen*, and their graduates are perceived by employers as equivalent, in spite of their studies having been less theoretical and in-depth.

The "school-based portion of apprenticeship training in most of the German states has begun to include a critical analysis of technology, so that students are better prepared to participate in the 'active shaping' of technology and work." (Stern, Bailey and Merritt, 1996, p. 15) The ILO indicates that "German enterprises ... routinely encourage workers to upgrade from skilled (*Facharbeiter*) to master (*Meister*) and technician (*Techniker*)." (ILO, 1998, p. 3)

Transfer and Replication of the Dual System Model

The World Bank noted that "the dual system is alluring for other countries, some of which have sought German assistance in transforming their vocational education and training systems to resemble that of Germany." (Gill and Dar. 1996, p. 1) The National Center for Research in Vocational Education (NCRVE) at The University of California at Berkeley indicated that some countries try to emulate the success of the German Dual System because they observe that "students ... have clear incentives to perform well in school because there are real and discernible connections between good jobs and good grades" so they try "to increase employer involvement in youth education and training." (NCRVE, 1997, p. 1) One World Bank economist noted that "the German experience in seeking to transfer the German dual apprenticeship training to developing countries has not appeared especially successful." (Daly, 1996, p. 5)

Even if it were possible to transfer the Dual System intact to another country,

cultural and historical factors suggest that the replicated system would differ considerably from the original 'model.' Ulrich labelled this the "*Ausbildungskultur*, or culture of in-firm training." (1997, p. 314) Deissinger quotes Schaak (1997) that "there remains substantial scepticism when it comes to the implementation or emulation of features of the German 'training culture' in a different sociocultural context." (Deissinger, 1997, p. 301) This writer shares this scepticism, having noted in 1992 that "although many best practices can be adopted from elsewhere, the borrowing of mechanisms without adaptation to Ontario conditions and cultural practices is not recommended" and that "while the German [and other] certification mechanisms operate well in their business/industry/union milieux, they are not considered appropriate for Ontario, or Canada." (Wilson, 1992, p. 66)

Gill and Dar do make a cautionary statement about the feasibility of adopting the Dual System. They note that "while it is unreasonable to expect a system that has matured in a country which is now highly industrialized, has strong workers' and employers' unions and well-developed regulatory and administrative mechanisms, to be readily adaptable to countries that do not share any of these attributes, these countries can learn more general lessons from the German apprenticeship experience." (1996, p. 1) Deissinger "stressed that even a vocational training system which strongly resembles the pattern of German apprenticeships would function very differently." (1997, p. 301)

German development assistance is, largely, provided through the *Deutsche Gesellschaft für Zusammenarbeit* (GTZ), which is a federal agency that "implements technical cooperation activities for the government ... in 130 countries of Africa, Asia and Latin America and in the transitional countries of Central Europe...[with]...more than 10,000 GTZ" workers. Funding for GTZ is provided by "the Federal Ministry for Economic Cooperation Development (BMZ)." The GTZ 1998 Annual Report noted that from their experience "development results are only achieved in our partner countries if changes take place at various levels of society simultaneously, and are harmonised." (GTZ Web Page) This comment suggests that the focus of development assistance is changing from project-specific activities, such as the development of Dual System capabilities, to the integration of such capabilities into the overall social, economic and cultural milieux.

Kraemer indicated that "elements of the German dual system have been adopted successfully in other countries, such as India, Peru, and Brazil." (1995, p. 1) However, she also noted that "although the dual system has been working well

for Germany, it is not immediately obvious that the system might be easily transferable to other countries." She attributes the success of the dual system in Germany to "German culture," which "emphasizes preparing students for the workplace," and notes that Germany has also had a "long tradition of business support" for the dual system. Finally, Kraemer observes that "the relatively high homogeneity of the German student population allows for more standardization." (*Ibid.*)

It is instructive that among the problems "spawned"by German Reunification in 1990 was the difficulty encountered in replicating the Dual System in the six new *Lander* of the former *Deutsche Democratische Republik* (DDR). Schmidt observed that "while the former East German workforce needed to be retrained, significant numbers of young people were unable to secure apprenticeship positions, due to a shortage of companies participating in such programs." (1998, p. 24) Instead, the "Federal Government of the unified Germany developed and implemented non-company-based vocational training programs in the region of the former East Germany." (*Ibid.*) Similarly, the International Labour Organisation noted that many Eastern European countries, such as "Hungary, Lithuania and Slovenia, are working to adapt a dual system." (ILO, 1998, p. 2)

Micro case studies of several representative nations, which have either successfully transferred and replicated aspects of the Dual System, or where transfers have not been successful, are provided below. These country case studies are in various stages of development -- ranging from newly-implemented to long-established -- and are listed in alphabetical order.

Botswana

In Botswana, "a modified form of the German 'dual system' of apprenticeship training was adopted to provide the necessary pool of skilled labour for industry." In an evaluation of apprenticeship training, Franklin and van der Linden noted that "cultural determinants, in particular the high status of the 'meister,' the constraints upon competition among firms for skilled workers, and the flexibility of the educational institutions in adapting their offering to industry's needs" led to its failure "to be totally adopted as the national system for Botswana." (1999, p. 41)

Wilson, Kennedy and de Jocas (1999) found that "there was widespread agreement that the current apprentice-training system... does not function well." (p. 3-1) "The system purports to be a version of the German 'Dual System'" and was

"established in 1986 with assistance from... GTZ. to the Ministry of Labour and Home Affairs (MoLHA) which was extended until 1998." (*Ibid.*)

"Due to the insufficient number, small size, and dispersed locations of ...enterprises in Botswana, this German rotation system has not been feasible. It appears the MoLHA soon reverted to the 'old' British 'Block-Release' system, which involves nine months in enterprises and three months, or two terms of 13 weeks, in educational institutions." (*Ibid.*) Moreover, employers in Botswana had insufficient supervisory personnel to train apprentices, during their in-enterprise component, and the MoLHA had an insufficient number of personnel to supervise the in-enterprise training component. (*Ibid.*) The Department of Vocational and Technical Education of The Botswana Ministry of Education has decided to replace the apprenticeship training system with an in-school training system at its Vocational Training Centres (VTCs).

Costa Rica

Mittmann described a two-year old pilot project in Costa Rica in which GTZ is adapting the Dual System to local conditions, in association with the Instituto Nacional de Aprendizaje (INA) and the Colegio Vocacional Monseñor Sanabria. He describes the "permanent co-operation with private enterprises," comprising "more than twenty automotive workshops," as a "parallel training [system] in two apprenticeship centres, small enterprises, and a technical college." (Mittmann, 1998) The system comprised two days of practice work in the private sector auto shops during the first year of training and three days in the second year. (Mittmann, 1997) His assessment is that this training has been more closely related to the requirements of participating small enterprises than either academic, or INA technical, education. (Mittmann, 1998)

Dominican Republic

A similar project of co-operation between GTZ and a national training board "began in 1987" between INFOTEP (Instituto Nacional de Formación Technico Profesional) in the Dominican Republic and small and medium-sized industries. A Dual System of apprenticeship training was established in Industrial Mechanics, Auto Mechanics and Cabinet Making. CINTERFOR (The ILO Research and Documentation Centre in Vocational Training for Latin America) evaluated the

impact of this project in 1994 by interviewing 86 of the 232 youth between 18 and 24 years of age who had completed the programme between 1990 and 1992. Ninety percent were working in the occupations for which they had been trained at an above-average salary. The majority were employed in those enterprises where they had undergone their training. A "high percentage" of the former apprentices "gave satisfactory responses with respect to the preparation they received, improvement in their work habits and skills, and the time it took to develop their competencies." Their supervisors commented favourably on their "discipline in the workplace, habits of hygiene and safety, and responsibility" and indicated that they were "superior to their colleagues with respect to productivity and work organisation." (CINTERFOR, 1996, pp. 1 and 2)

India

An International Labour Organisation (ILO) workshop on the "Development of a National System of Vocational Qualifications" for India noted that "the standardization of vocational training, skills and qualifications has not yet been well established" and that "systems being used in other countries are being studied as possible models to be emulated." Since "each state in India has a degree of autonomy in adopting its own educational system," there was noted to be a lack of standardisation. The experience of one Indian state in its "attempt to introduce a dual system, which emphasized practical aspects more than theory" was described as a failure. The failure was attributed to "insufficient equipment and facilities, unqualified teachers and instructors, inadequate training systems for teachers, a lack of linkage with industries, the inferior status of vocational education, and the ineffectiveness of centrally sponsored schemes." (UNEVOC INFO, 1998, p. 4)

Indonesia

In Indonesia, the National Technical and vocational Education and Training Project (NTVET), which is "part of the Indonesian-German partnership in development," promotes a "co-operative (dual) and demand-driven vocational education and training" which "draws on best practice experiences such as dual training in Germany." (NTVET webpage) UNEVOC noted the "implementation

of a dual system (*Sistem Gandha*) in Indonesia ... in order to better integrate tuition and structures on-the-job industry training." (Qureshi, 1996, p. 2) However, this project is likely to have been implemented at only a small portion of the Technical-Vocational STMs, Commercial/Business SMEAs, and Home Economics SMKKs in Indonesia. In 1990, SMEA enroled 18.4 percent, STM enroled 12.4 percent and SMKK enroled 1.2 percent of all secondary students. (Wilson, 1993, p. 8) Like many developing nations, Indonesia seems to have many parallel technical assistance projects, each seeking to transfer its TVET system. The largest of these entities is the Australian group assisting the Directorate-General of Technical and Vocational Education in the Ministry of Education. The AIDAB/AUSAID presence in Indonesia antedates the Germany presence by over 25 years and has been responsible for the development of the current TVET curriculum. (*Ibid.*)

Lebanon

In conformity with the restructuring policy of the Lebanese Ministry of National Education, GTZ was involved in implementing the Dual System at selected technical secondary schools. The policy indicated that "it is necessary to promote a certain participation between the educational institutions and enterprises in which the latter participate in the continuing training of apprentices in their establishments, building sites and workshops. This is known by the name "dual system." (CNRDP, 1995, p. 19)

At the policy level, the Lebanese Ministry of National Education may have confused the German Dual System with the French *formation par alternance* system. This is apparent because the majority of the reform documents draw heavily from the French educational system, both in general and technical education. The credential noted to be given at the second cycle of secondary technical education is the *Bac Technique*, or Baccalaureat given in France at the same level. The proposed Lebanese system is also divided into three *domaines*, or options: Agronomy, Industry and Services (including finance, commerce, management, tourism, information, hotel, health, etc.) (*Ibid.*, p. 62)

The Fourth Module of these courses is to be provided "in factories and building sites relevant to production establishments or in workshops." The Fourth

Module is to comprise "35 to 40 percent of the total periods in the first year and that will increase progressively to 40 to 50 percent of the total periods in the second and third years." (*Ibid.*, p. 64)

The GTZ pilot programme in Lebanon in 1996 had two components: (1) Dual System training in Auto Mechanics and Industrial Mechanics were introduced in four Vocational Schools in Tripoli, Bekaa, Sidon and Dekwanah, and (2) the Training of Trainers in Beirut. The apprentices spent seven month in the Vocational Schools and two months on Practicum in companies during the first year. In their second and third years, the apprentices spent three days in companies and two days per week at the Vocational Schools. The GTZ Project Director, Dr. Frank Kilius, was working with Lebanese Industrial Associations to replicate the Chamber of Commerce and Industry relationships essential to the Dual System in Germany. (Interview, 2 May 1996)

The Ministry of Vocational Education and Training was noted to be "planning to train 40,000" Lebanese youth in the Dual System during the course of the GTZ project. (*Ibid.*) However, since the interviews were undertaken in 1996 at the commencement of the GTZ project, follow-up is required in order to determine how successful GTZ has been in replicating the Dual System in Lebanon.

Seychelles

The ILO proposed improvement of "the present ad hoc apprenticeship programme" in the Seychelles in 1997. It was recommended that the apprenticeship "programme should be improved with greater involvement of employers based on [the] sandwich pattern of attendance of [a] 'dual system' encompassing institutional and in-plant training closely monitored by the Polytechnic and the proposed" Seychelles National Training Agency. (ILO, 1997, p. 14) In addition, the ILO recommended that the Seychelles organise "post-secondary technician training through an apprenticeship scheme involving supervised institutional and in-plant training (dual system) with close collaboration with employer and formalized through [a] contract of apprenticeship." (*Ibid.*, p. 18)

Singapore

One reason for the successful adoption and adaptation of the Dual System model in Singapore may be discerned from Daly's comment that "the newly

industrialized countries (NICs) have been particularly successful in capitalizing on relatively new technologies – especially information technologies, but also biotechnology and aspects of materials technologies." (1996, p. 3)

The former Singapore Vocational and Industrial Training Board [now renamed The Institute of Technical Education] "introduced new and improved provisions modelled towards achieving a 'dual system' as practised in Germany" in 1991. Pillay wrote that the objective was "to create job entry skills training for the majority of school leavers not proceeding to post-secondary or tertiary institutions." (Pillay, 1992, p. 26) These school leavers comprised about 25 percent of the upper secondary school track. Oliveira and Pillay indicated that the reasons Singapore introduced its version of the Dual System were:

> First, it is being adopted in very specific areas...where pre-employment training is not enough, is not in place (like most service areas) or is not cost-effective (as in the hotel business), given the relatively small number of trainees and the very high cost of training facilities. In this case, it is an alternative mechanism which contributes to increasing the reach and the flexibility of the existing training system. But there is also another, very important reason: the dual system is being introduced as an alternative training mechanism for those already engaged in the workforce or for youngsters who start working before they finish a technical education program. In other words, it is part of the governmental effort to upgrade the level of the entire workforce. (1992, p. 4)

In addition to the adoption -- and adaptation -- of the Dual System at the secondary level, Singapore has also adopted German institutions at the post-secondary level. The NCRVE exemplified the German-Singapore Institute, "founded in 1981 as a joint venture between the Economic Development Board of Singapore and the German Agency for Technical Co-Operation," as a 'teaching factory' which is "organized more like a business than a school." The GSI trains "technicians and middle managers in a variety of manufacturing specialities." (NCRVE, 1997, p. 6) This writer visited the GSI in 1981 and noted in 1997 that "it is also likely that the presence of German aid personnel in Singapore from the early 1970s ... provided a good introduction to the dual system model." (1997, p. 444)

Wilson also noted that "the Singaporean adaptation [of the Dual System] appears to have replicated the degree of *integration* of system elements evident in

Germany and also shows evidence of similar *dedication* or *sense of purpose* and *discipline*; attributes which have made the dual system effective in Austria, Germany, and Switzerland." (1997, p. 444)

Sri Lanka

In Sri Lanka, GTZ has had long-standing projects with the Ministry of Vocational Training and Rural Industries and the Ministry of Education and Higher Education. (GTZ Webpage) The "disruptions caused by civil conflict had rendered" the "TVET policies ...modelled upon the German dual system ...almost ineffectual." (Wilson, 1997, p. 441) The one Sri Lankan TVET institution which appears to have been modelled upon the German BIBB, is the Tertiary and Vocational Education Commission (TVEC), which "is the apex statutory body in vocational education and training." The TVEC's "main responsibility is planning, co-ordination and developing of ...vocational education." (UNEVOC Webpage)

Thailand

'If at first you don't succeed ...' The Dual System was first introduced in Thailand in 1959, with the establishment of the Thai-German Technical Institute under the Department of Vocational Education (DoVE) in the Ministry of Education. (Utakrit, 1999, p. 43) Several Thai-German pilot projects tested various apprenticeship schemes during the 1960s. However, it was not until 1995 that DoVE decided to implement the Dual Vocational Training (DVT) on a nation-wide basis, calling it "a new concept in Thailand." (Ministry of Education, 1999) The objective of the current reform is to make TVET more work-related and co-operation between "the two partners in DVT must [comprise] common objectives, procedures, monitoring and evaluation standards." (*Ibid.*).

The Certificate- level DVT is a three-year programme after Grade Nine (Lower Secondary School) with the first two years in Technical Secondary Schools and the final year in Technical Colleges. The Diploma-level DVT is a two-year programme after the Certificate level in Technical Colleges. (UNEVOC Webpage) DVT students receive both classroom and workplace experience in enterprises. The curriculum has been re-organised with subjects that are more oriented towards practical skills and training becoming part of in-enterprise training. (Ministry of Education webpage)

The "key feature" of the revived Dual System "is collaboration of the secondary schools and colleges" with enterprises. (Howard, 1999, p. 13) Theoretical studies are provided by the educational institutions while 'hands-on' experience is provided in a typical work-place environment. (*Ibid.*) DVT was noted to "increase the capacity of DoVE colleges... and supports government policy to offer 12 years of schooling to every one of our young people by 2007." (Ministry of Education webpage)

In 1995, Technical Colleges formed alliances with over 1,200 enterprises to educate 10,056 students in the DVT. (Howard, p. 14) This enrolment comprised only 3.5 percent of the total DoVE enrolment of about 600,000. By 1997, the DVT component had expanded to over 20,000 students, with 2,500 enterprises involved. (Ministry of Education webpage) Thus far, the DVT appears to have introduced some of the criteria that characterise the German 'model,' but it seems to be too early to determine whether or not this time the transfer will be successful.

Other Suggested Transfers

Considerable attention has been paid to the Dual System by British and U.S. writers. Shakleton (1997, p. 304) wrote that "its existence depends on a particular form of political economy which cannot easily be transferred to the British Economy." One 'weakness' of the Dual System was noted to be the "restrictions relating to ... employment of trained labour, " for example, "even sales assistants must undergo lengthy formal apprenticeships." This was noted to "significantly limit competition in the labour market." (*Ibid.*, p. 305)

Buck noted that the Dual System "has long enjoyed a favorable reputation in the United States and is frequently the subject of contributions to American VET literature." (1997, p. 2) A "Work-based Youth Apprenticeship" programme "inspired by the German dual apprenticeship system" was advocated for the United States by the Institute on Education and the Economy in 1993. Their proposal contained four "essential components:"

1. It is designed to be an integral part of the basic education of a broad cross-section of youth. It is not for specific occupations or specific target groups.

2. Its educational component integrates and coordinates academic and

vocational content. Apprenticeship programs are designed to teach broad employability skills.

3. A significant part of the basic education is to take place on the job, complemented by classroom instruction.

4. This option requires a system of credentials for students who successfully complete the program. These credentials certify achievement for specified levels of skills

Discussion and Conclusions

The initial sections of this paper endeavoured to provide as complete a picture as possible of the very complex German educational system and its Dual System of occupational training. The section on modernisation of the Dual System indicates that the 'model' admired by and emulated by other countries continues to evolve; changing in response to the challenges of globalisation and the demands of technological change. This description set the stage for an examination of efforts to transfer and replicate the Dual System in selected developing nations.

Among the nations examined, only Singapore seems to have replicated the German record of the participation of between 64 and 81 percent of the 16-18 year-old age cohort in the Dual System. Even in Singapore, the participation rate is likely to be no greater than 35 or 40 percent of the age cohort. The percentages of participation are minimal in Thailand, Indonesia, Costa Rica, etc.

Wilson (1997) quoted from his ILO study of the *Effectiveness of National Training Boards* (1993, p. 2) which examined the BIBB and found that:

> The German ... philosophy that all youth should be provided with initial occupational training ... appears to be gaining favour with many other developed, and some developing nations. The reasons for this were, *inter alia,* that initial training is not merely technical ... but also attitudinal and those employees who have acquired a 'solid' initial training are more easily re-trained than those without initial training. (p. 442)

The replication of this 'philosophy' in Singapore is highly likely to have been accomplished effectively, but it is questionable whether this aspect of the Dual system has transferred well to any of the other nations examined.

The integration of academic and technical-vocational curricula, which has developed in Germany, is extremely difficult to emulate in nations where a *stigma,*

and/or a second-class perception of TVET, has evolved. Similarly, the clear incentives to perform well in school, which characterises the Dual System in Germany, appears to have been replicated only in Singapore by the Institute of Technical Education (ITE).

Durden (1996, p. 4) stated that "what is important about [the] Dual System is not the uniformity it imposes, but the standards it upholds." The ILO concluded that in India, "the standardization of vocational training, skills and qualifications has not yet been well established." (UNEVOC INFO, 1998, p. 4) Although the DVT system now being implemented in Thailand is relatively 'young,' its focus upon standard-setting is encouraging.

The fact that German enterprises spent three times the amount provided by *Lander* for their *Berufsschulen* on in-enterprise training components constitutes a significant attribute of the Dual System. This feature reflects the long tradition of business support for the Dual System. Again, with the possible exception of Singapore (for which no recent data are available), it is apparent that none of the nations examined even come close to replicating this feature of the Dual System.

The continual upgrading of the theoretical and intellectual content of both the in-school and in-enterprise components of the Dual System constitutes another important feature. It is encouraging that Thailand may be adopting this feature in its new DVT system, but it remains too early to confirm or refute this observation. The fact that Singapore has modernised its TVET systems at least four times during the past four decades suggests that the ITE and other institutions share this commitment to curricular modernisation.

The German trend in which a growing number of *Abitur* graduates of the *Gymnasium* academic track are completing Dual System apprenticeships prior to entering university is also considered to be an important development. In this instance, the facilitation of mobility and articulation in Singapore may well be replicating this new feature of the German system. The possibility of German-Singapore Institute graduates enroling in the Polytechnics seems to validate this replication. The open-ness in the new Thai DVT system also appears to be encouraging in this respect.

Replication of the *ausbildungskultur*, or culture of in-firm training, may well be the

most difficult-to-develop attribute of the Dual System. It is quite clear that efforts to develop this feature in Botswana were a complete failure. The 'cultural' discipline in Singapore is deemed most likely to replicate this attribute. The similarities in cultural discipline may reflect the melding of Singapore's constituent three cultures into a mono-culture, which can be compared with the cultural homogeneity of the German student population, noted above.

The findings of the CINTERFOR evaluation of the Dominican Republic Dual System of training are encouraging. The favourable comments of supervisors of the former apprentices about their discipline in the workplace, habits of safety and hygiene, and responsibility suggest that some attributes of the German Dual System have been effectively transferred. Moreover, the finding that the majority were working in the same enterprises where they had undergone their in-plant training is also encouraging. Finally, the finding that 90 percent of the former apprentices were working in the occupations for which they had been trained seems to outperform German experience, since Deissinger indicated that "more than 50 percent of former apprentices [in Germany] remain in the occupation for which they were trained." (1997, p. 301).

Although the only indictment of the failure of a replicated Dual System to provide sufficient equipment and facilities, qualified teachers and instructors, adequate teacher/instructor training systems, linkage with industries, and improvement of the inferior status accorded to TVET, was in one Indian state, it is quite likely that these features have contributed to the failure of attempts to replicate the Dual System in other countries. Such infrastructure attributes appear to be the minimum likely for the successful transfer and replication of the Dual System. However, it is equally apparent that even the failure of one of these infrastructural attributes can 'doom' a TVET system.

It was originally intended to include The United Arab Emirates among the micro case studies; however, the writer and a colleague were unsuccessful bidders last year for an opportunity to evaluate GTZ assistance from 1996 in building the UAE TVET system. Our experience elsewhere in the region suggested that, in spite of the construction and equipment of exemplary TVET institutions and the introduction of a state-of-the-art curriculum, the likely staffing of these institutions

with instructors engaged more for their language capabilities than technical and pedagogical qualifications, may have frustrated the development of these institutions. However, without validation for this 'hunch,' it was decided to omit consideration of the UAE.

Moreover, even the availability of excellent TVET personnel is insufficient when quality facilities and equipment are not available. Wilson (1986) observed that Sudanese technical educators had assisted in the development of quality TVET systems in many Gulf States, and then returned home to a system devoid of infrastructure. The human rights record of the Government of The Democratic Republic of The Sudan has impeded finance and implementation of a World Bank project to rehabilitate this TVET infrastructure. (Wilson, 1986)

The micro case studies and citations from various available literature suggest that what we do know about the transfer and replication of the German Dual System of occupational training to both developing and developed nations is insufficient. It is encouraging that considerably more published information is available at this time than was available when this writer prepared the earlier study on the transfer and replication of policy aspects of the Dual System. This suggests that a continuing series of studies, in both Germany and elsewhere, is necessary to enhance our knowledge.

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